FINAL REPORT
JULY 2007

REPORT NO. 06-04J

EVALUATION TRANSPORTABILITY TESTING OF THE JOINT MODULAR INTERMODAL PLATFORM (JMIP) UNIT #4 TP-94-01, "TRANSPORTABILITY TESTING PROCEDURES"

Prepared for:

Distribution Unlimited:

TACOM/ARDEC
Logistics Research and Engineering Directorate
ATTN: AMSRD-AAR-AIL-F
Picatinny Arsenal, NJ 07806

DEFENSE AMMUNITION CENTER
VALIDATION ENGINEERING DIVISION
MCALESTER, OKLAHOMA 74501-9053

AVAILABILTY NOTICE

A copy of this report will be furnished each attendee on automatic distribution. Additional copies or authority for reprinting may be obtained by written request from:

Director
U.S. Army Defense Ammunition Center
ATTN: SJMAC-DEV
1 C Tree Road, Bldg. 35
McAlester, OK 74501-9053

DISTRIBUTION INSTRUCTIONS

Destroy this report when no longer needed. Do not return.

***

Citation of trade names in this report does not constitute an official endorsement.

***

The information contained herein will not be used for advertising purposes.

REPORT NO. 06-04J **JULY 2007**

EVALUATION TRANSPORTABILITY TESTING OF THE JOINT MODULAR INTERMODAL PLATFORM (JMIP) UNIT #4 TP-94-01, REV. 2, JUNE 2004, "TRANSPORTABILITY TESTING PROCEDURES"

ABSTRACT

The U.S. Army Defense Ammunition Center (DAC), Validation Engineering Division (SJMAC-DEV), was tasked by the Logistics Research and Engineering Directorate (AMSRD-AAR-AIL-F), Picatinny Arsenal, NJ to conduct evaluation transportability testing on the Joint Modular Intermodal Platform (JMIP) Unit #4 manufactured by SEA BOX, Inc, East Riverton, NJ. The testing was conducted in accordance with TP-94-01, Revision 2, June 2004 "Transportability Testing Procedures." The test payload consisted of a mixed load of palletized ammunition and the Joint Modular Intermodal Containers (JMICS).

The objective of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval when transportability tested in accordance with TP-94-01, Revision 2, June 2004.

The following observations resulted from the testing of JMIP Unit #4:

1. Prior to the start of testing, the bolts holding the rear bumpers were tightened.
2. The SEA BOX intermediate gates were used to restrain the payload.
3. The connection between the JMIC interface rings and the intermediate gates had enough tolerance to allow the gates and dunnage to go past vertical during testing.
4. The engage/disengage mechanism on the intermediate gate is only accessible from one side. Therefore, the gates have to be properly oriented or the mechanism may be blocked by the payload. The gate design should be

uniform, with access to the mechanism on each side so that they do not have a front or back.

5. The operation of the engage/disengage mechanism was unsafe when installing/removing the intermediate gates due to problems with finger pinching.

6. The intermediate gates need a location where nails can be driven in and cinched to prevent movement of the dunnage between the gate and the payload.

7. When loading the JMIP into the intermodal container, the point load caused by the JMIP side rail deformed the wall of the container.

8. The JMIP slid side-to-side throughout the STS testing. The movement of the adjustment bolt on the cams occurred during the testing. Future designs of the cam locking devices should prevent the bolts from moving in and out.

9. The main rails scuffed and dug into the container floor during the STS testing.

10. The tie-down rings used to secure the 120MM Tank Ammunition Pallets contacted the container wall during the STS testing.

11. One (1) bolt on the rear bumper was loose and one (1) bolt fell out during testing.

12. The locks on some of the JMICs were difficult to unlock upon completion of the testing. The use of a pry bar was sometimes required to disengage the locks.

The purpose of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval. Testing has identified deficiencies with the current design.

The JMIP, as currently designed, is adequate, to be used to transport the mixed load of palletized ammunition and the JMICs when using the intermediate gates and restraint straps on the end of the payload during the demonstrations.

The operational condition of the JMIP should be closely monitored during the demonstrations. Also, the Defense Ammunition Center, Transportation Engineering Division, shall be consulted for the ammunition loading and bracing instructions.

Prepared by:

PHILIP W. BARICKMAN
Lead Validation Engineer

Reviewed by:

JERRY W. BEAVER
Chief, Validation Engineering Division

U.S. ARMY DEFENSE AMMUNITION CENTER

VALIDATION ENGINEERING DIVISION
MCALESTER, OK 74501-9053

REPORT NO. 06-04J

EVALUATION TRANSPORTABILITY TESTING OF THE JOINT MODULAR INTERMODAL PLATFORM (JMIP) UNIT #4, TP-94-01, REVISION 2, JUNE 2004 " TRANSPORTABILITY TESTING PROCEDURES"

TABLE OF CONTENTS

PART 1 – INTRODUCTION

A. BACKGROUND. The U.S. Army Defense Ammunition Center (DAC), Validation Engineering Division (SJMAC-DEV), was tasked by the Logistics Research and Engineering Directorate (AMSRD-AAR-AIL-F), Picatinny Arsenal, NJ to conduct evaluation transportability testing on the Joint Modular Intermodal Platform (JMIP) Unit #4 manufactured by SEA BOX, Inc, East Riverton, NJ. The testing was conducted in accordance with TP-94-01, Revision 2, June 2004 "Transportability Testing Procedures." The test payload consisted of a mixed load of palletized ammunition and the Joint Modular Intermodal Containers (JMICs).

B. AUTHORITY. This test was conducted IAW mission responsibilities delegated by the U.S. Army Joint Munitions Command (JMC), Rock Island, IL. Reference is made to the following:

1. AR 740-1, 15 June 2001, Storage and Supply Activity Operation.

2. OSC-R, 10-23, Mission and Major Functions of U.S. Army Defense Ammunition Center (DAC) 21 Nov 2000.

C. OBJECTIVE. The objective of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval when transportability tested in accordance with TP-94-01, Revision 2, June 2004.

D. OBSERVATIONS.

1. Prior to the start of testing, the bolts holding the rear bumpers were tightened.
2. The SEA BOX intermediate gates were used to restrain the payload.

3. The connection between the JMIC interface and the intermediate gates had enough tolerance to allow the gates and dunnage to go past vertical during testing.

4. The engage/disengage mechanism on the intermediate gate is only accessible from one side. Therefore, the gates have to be properly oriented or the mechanism may be blocked by the payload. The gate design should be uniform, with access to the mechanism on each side so that they do not have a front or back.

5. The operation of the engage/disengage mechanism was unsafe when installing/removing the intermediate gates due to the problems with finger pinching.

6. The intermediate gates need a location where nails can be driven in and cinched to prevent movement of the dunnage between the gate and the payload.

7. When loading the JMIP into the intermodal container, the point load caused by the JMIP side rail deformed the wall of the container.

8. The JMIP slid side-to-side throughout the STS testing. The movement of the adjustment bolt on the cams occurred during the testing. Future designs of the cam locking devices should prevent the bolts from moving in and out.

9. The main rails scuffed and dug into the container floor during the STS testing.

10. The tie-down rings used to secure the 120MM Tank Ammunition Pallets contacted the container wall during the STS testing.

11. One bolt on the rear bumper was loose and one fell out during testing.

12. The locks on some of the JMICs were difficult to unlock upon completion of the testing. The use of a pry bar was sometimes required to disengage the locks.

E. CONCLUSIONS.

1. The purpose of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval. Testing has identified deficiencies with the current design.

2. The JMIP, as currently designed, is adequate to be used to transport the mixed load of palletized ammunition and the JMICs when using the intermediate gates and restraint straps on the end of the payload during the demonstrations.

3. The operational condition of the JMIP should be closely monitored during the demonstrations. Also, the Defense Ammunition Center, Transportation Engineering Division, shall be consulted for the ammunition loading and bracing instructions.

PART 2 - ATTENDEES

ATTENDEE	MAILING ADDRESS
Philip Barickman DSN 956-8992 (918) 420-8992	Director U.S. Army Defense Ammunition Center ATTN: SJMAC-DEV 1 C Tree Road, Bldg. 35 McAlester, OK 74501-9053
Michael Bartosiak DSN 956-8083 (918) 420-8083	Director U.S. Army Defense Ammunition Center ATTN: SJMAC-DET 1 C Tree Road, Bldg. 35 McAlester, OK 74501-9053
Tom Sieffert (973) 724-2115	U.S. Army Armament Research, Development and Engineering Center Logistics Research & Engineering Dir. ATTN: AMSRD-AAR-AIL-F Picatinny Arsenal, NJ 07806-5001

PART 3 - TEST EQUIPMENT

1. Joint Modular Intermodal Platform Unit #4
   Manufactured by SEA BOX, Inc., East Riverton, NJ
   Model Number: J-MIP
   Serial Number: 00004
   Date of Manufacture: 26 January 2007
   Tare Weight: 4,240 lbs (without straps, rings and end gates)

2. Joint Modular Intermodal Container
   Designed by Naval PHST Center - Earle, NJ
   Length: 51-3/4 inches
   Width: 43-3/4 inches
   Height: 43 inches

3. Palletized Load System Truck
   Model #: M1074
   Manufactured by Oshkosh Truck Corporation, Oshkosh, WI
   ID #: 10T2P1NH6N1044011
   NSN: 2320-01-304-2277
   Serial #: 44011
   Curb Weight: 55,000 lbs

4. Truck, Tractor, MTV, M1088 A1
   ID #: J0231
   NSN: 2320 01 447 3893
   VSN: NL1FR5
   MFG Serial #: T-018447EFJM
   Weight: 19,340 lbs

5. Semitrailer, flatbed, breakbulk/container transporter, 22.5 ton
   Model #: M871
   Manufactured by Southwest Truck Body, St. Louis, MO
   ID #: NX03PJ – 0063
   NSN: 2330 00 122 6799
   Weight: 15,630 lbs

6. Railcar DODX 42353
   Manufactured by Thrall Car
   Length: 89 feet – 4 inches
   Empty Weight: 85,000 lbs.

7. Intermodal Container
   ID # USAU 020112-1
   Date of Manufacture: 05/95
   Manufactured by Med Union Containers, Izmir, Turkey
   Tare Weight: 4,920 lbs
   Maximum Gross Weight: 52,910 lbs

PART 4 - TEST PROCEDURES

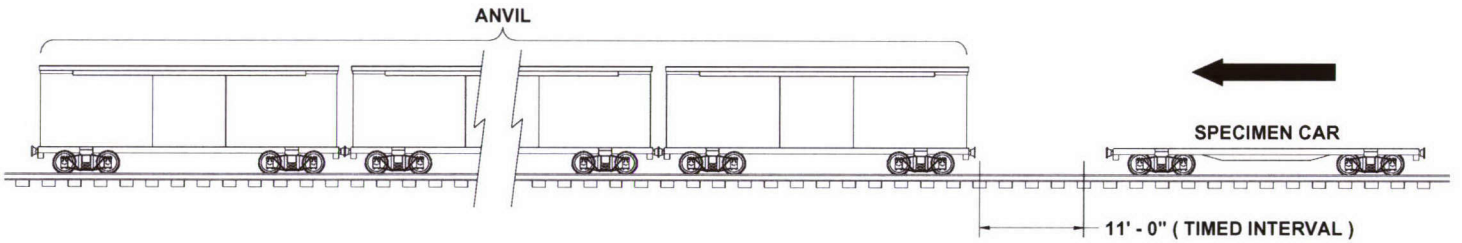
The test procedures outlined in this section were extracted from TP-94-01, "Transportability Testing Procedures," Revision 2, June 2004, for validating tactical vehicles and outloading procedures used for shipping munitions by tactical truck, railcar, and ocean-going vessel.

The rail impact will be conducted with the test load secured directly to the railcar. Inert (non-explosive) items were used to build the load. The test loads were prepared using the blocking and bracing procedures proposed for use with munitions (***see Part 6 – Drawings for procedures***). The weight and physical characteristics (weights, physical dimensions, center of gravity, etc.) of the test loads were similar to live (explosive) ammunition.

A. RAIL TEST. RAIL IMPACT TEST METHOD. The test load or vehicle will be secured to a flatcar. The equipment needed to perform the test will include the specimen (hammer) car, four empty railroad cars connected together to serve as the anvil, and a railroad locomotive. The anvil cars will be positioned on a level section of track with air and hand brakes set and with draft gears compressed. The locomotive unit will push the specimen car toward the anvil at a predetermined speed, then disconnect from the specimen car approximately 50 yards away from the anvil cars allowing the specimen car to roll freely along the track until it strikes the anvil. This will constitute an impact. Impacting will be accomplished at speeds of 4, 6, and 8.1 mph in one direction and at a speed of 8.1 mph in the reverse direction. The tolerance for the speeds is plus 0.5 mph, minus 0.5 mph for the 4 mph and 6 mph impacts, and plus 0.5 mph, minus 0 mph for the 8.1 mph impacts. The impact speeds will be determined by using an electronic counter to measure the time for the specimen car to traverse an 11-foot distance immediately prior to contact with the anvil cars (see Figure 1).

ASSOCIATION OF AMERICAN RAILROADS (AAR)

STANDARD TEST PLAN



4 BUFFER CARS (ANVIL)
WITH DRAFT GEAR
COMPRESSED AND AIR BRAKES IN A SET POSITION

ANVIL CAR TOTAL WT. 250,000 LBS (APPROX)

SPECIMEN CAR IS RELEASED BY SWITCH ENGINE TO
ATTAIN: IMPACT NO. 1 @ 4 MPH
IMPACT NO. 2 @ 6 MPH
IMPACT NO. 3 @ 8.1 MPH

THEN THE CAR IS REVERSED AND RELEASED BY SWITCH ENGINE TO ATTAIN:

IMPACT NO. 4 @ 8.1 MPH

Figure 1. Rail Impact Sketch

B. ON/OFF ROAD TEST.

1. HAZARD COURSE. The test load or vehicle will be transported over the 200-foot-long segment of concrete-paved road consisting of two series of railroad ties projecting 6 inches above the level of the road surface. The hazard course will be traversed two times (see Figure 2).

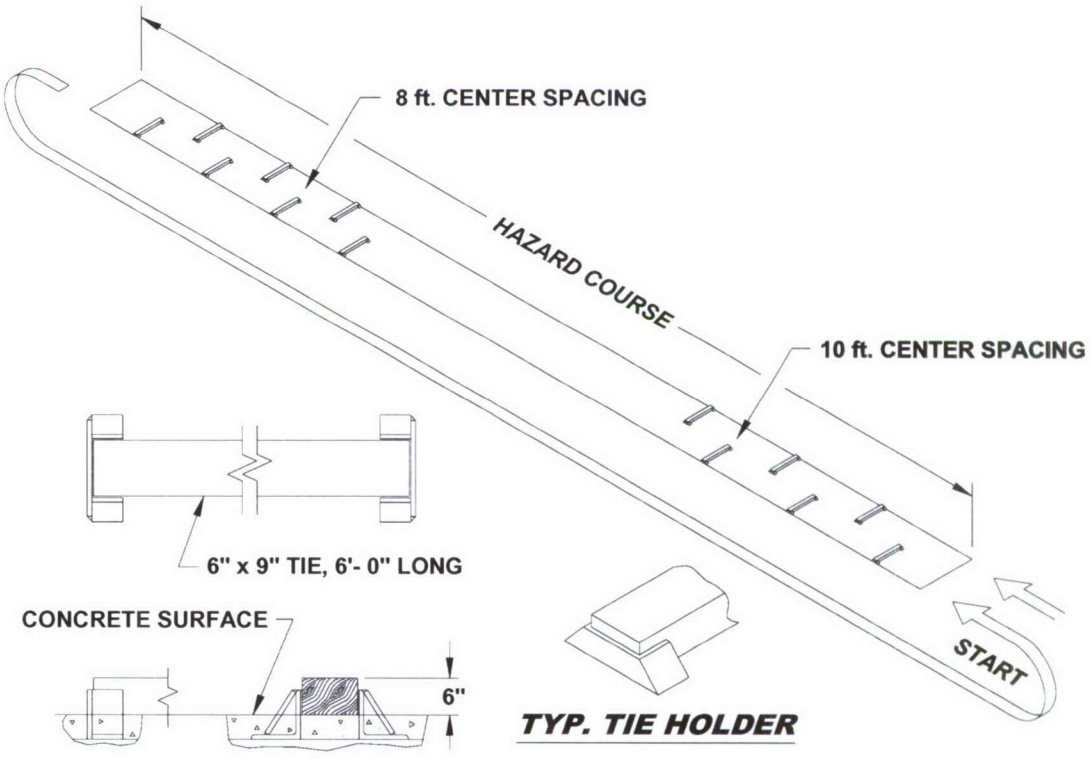


Figure 2. Hazard Course Sketch

a. The first series of 6 ties are spaced on 10-foot centers and alternately positioned on opposite sides of the road centerline for a distance of 50 feet.

b. Following the first series of ties, a paved roadway of 75 feet separates the first and second series of railroad ties.

c. The second series of 7 ties are spaced on 8-foot centers and alternately positioned on opposite sides of the road centerline for a distance of 48 feet.

d. The test load is driven across the hazard course at speeds that will produce the most violent vertical and side-to-side rolling reaction obtainable in traversing the hazard course (approximately 5 mph).

2. ROAD TRIP. The test load or vehicle will be transported for a distance of 30 miles over a combination of roads surfaced with gravel, concrete, and asphalt. The test route will include curves, corners, railroad crossings and stops and starts. The test load or vehicle will travel at the maximum speed for the particular road being traversed, except as limited by legal restrictions.

3. PANIC STOPS. During the road trip, the test load or vehicle will be subjected to three (3) full airbrake stops while traveling in the forward direction and one in the reverse direction while traveling down a 7 percent grade. The first three stops are at 5, 10, and 15 mph while the stop in the reverse direction is approximately 5 mph. This testing will not be required if the Rail Impact Test is performed.

4. WASHBOARD COURSE. The test load or vehicle will be driven over the washboard course at a speed that produces the most violent response in the vertical direction.

C. OCEAN-GOING VESSEL TEST. Shipboard Transportation Simulator (Test Method 5). The Shipboard Transportation Simulator (STS) is used for testing loads in 8-foot-wide by 20-foot-long intermodal freight containers. The specimen shall be positioned onto the STS and securely locked in place using the cam lock at each corner. Using the procedure detailed in the operating instructions, the STS shall begin oscillating at an angle of 30 degrees, plus or minus 2 degrees, either side of vertical center and a frequency of 2 cycles-per-

minute (30 seconds, plus or minus 2 seconds) for a duration of two (2) hours. This frequency shall be observed for apparent defects that could cause a safety hazard. The frequency of oscillation shall then be increased to 4 cycles-per-minute (15 seconds, plus or minus one second per cycle) and the apparatus operated for two (2) hours. If an inspection of the load does not indicate an impending failure, the frequency of oscillation shall be further increased to 5 cycles-per-minute (12 seconds, plus or minus one second per cycle), and the apparatus operated for four (4) hours. The operation does not necessarily have to be continuous; however, no changes or adjustments to the load or load restraints shall be permitted at any time during the test. After once being set in place, the test load (specimen) shall not be removed from the apparatus until the test has been completed or is terminated.

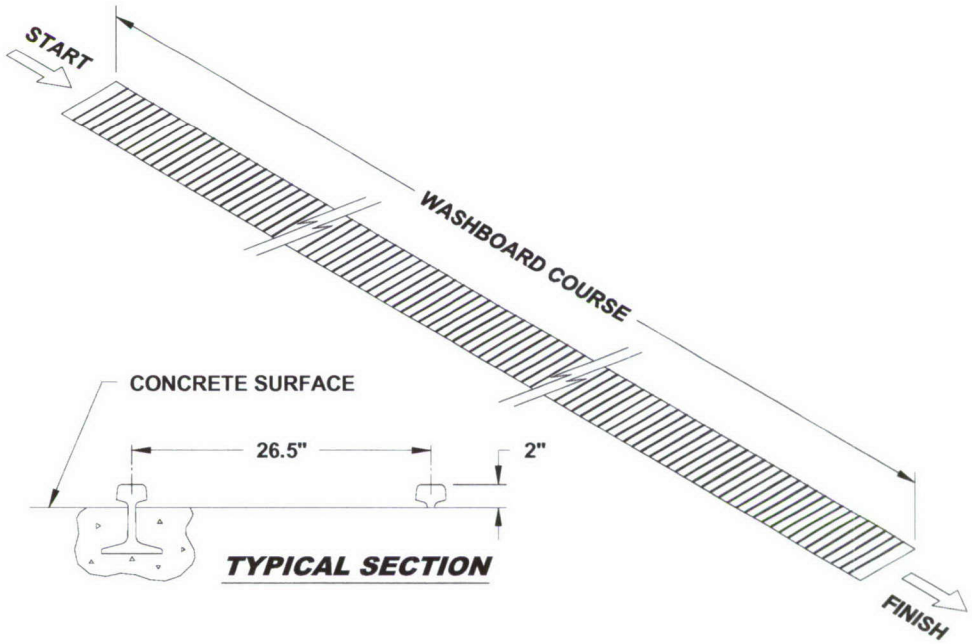


Figure 3. Washboard Course Sketch

PART 5 - TEST RESULTS

5.

Test Specimen: SEA BOX Joint Modular Intermodal Platform Unit #4

Payload: Mixed Load of Palletized Ammunition and
the Joint Modular Intermodal Containers (JMICs).

Testing Date: 1-5 June 2007

Gross Weight: 25,960 lbs (JMIP and payload)

Note:

1. Prior to the start of testing, the bolts holding the rear bumpers were tightened.
2. The SEA BOX intermediate gates were used to restrain the payload.
3. The connection between the JMIC interface rings and the intermediate gates had enough tolerance to allow the gates and dunnage to go past vertical during testing.
4. The engage/disengage mechanism on the intermediate gate is only accessible from one side. Therefore, the gates have to be properly oriented or the mechanism may be blocked by the payload. The gate design should be uniform, with access to the mechanism on each side so that they do not have a front or back.
5. The operation of the engage/disengage mechanism was unsafe when installing/removing the intermediate gates due to the problems with finger pinching.
6. The intermediate gates need a location where nails can be driven in and cinched to prevent movement of the dunnage between the gate and the payload.

A. RAIL TEST.

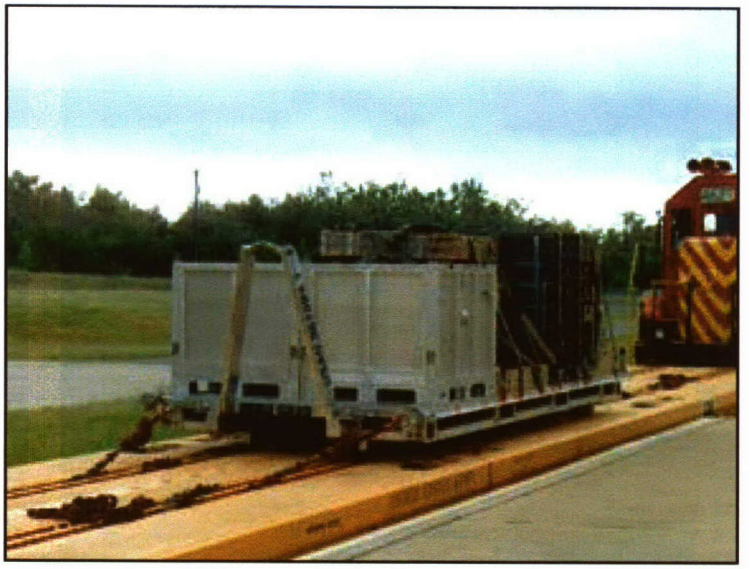


Photo 1. Rail Impact Testing of the JMIP (Prior to Testing)

Description	Weight
Flatcar Number: DODX 42353	85,000 lbs.
JMIP	25,960 lbs.
M1 Flatrack with MLRS Pods	28,265 lbs.
Total Specimen Wt.	139,225 lbs.
Buffer Car (four cars)	257,900 lbs.

Figure 4.

Remarks: Figure 4 lists the test components and weights of the items used during the Rail Impact Tests.

Impact Number	Avg. Velocity (mph)
1	4.6
2	6.3
3	8.1
4	8.6

Figure 5.

Remarks:

1. Figure 5 lists the average speeds of the specimen car immediately prior to impact with the anvil. Impact #4 is the reverse impact.
2. The JMIP was secured directly to the railcar for testing.
3. Inspection did not reveal any damage to the JMIP.

B. ON/OFF ROAD TESTS.

1. HAZARD COURSE.

Photo 2. Hazard Course Testing of the JMIP

Pass No.	Elapsed Time	Avg. Velocity (mph)
1	No Time	-------
2	23 Seconds	6

Figure 6.

Remarks:

1. Figure 6 lists the average speeds of the test load through the Hazard Course.
2. The JMIP was secured to the M871 trailer.
3. Inspection did not reveal any damage to the JMIP.

2. **ROAD TRIP:**

Remarks:

1. The Road Trip was conducted between the Hazard Course Passes #2 and #3.
2. Inspection following the Road Trip revealed no damage or movement of the JMIP.

3. **PANIC STOPS:** Testing was not required since the load was rail impact tested.

4. **HAZARD COURSE:**

Pass No.	Elapsed Time	Avg. Velocity (mph)
3	23 Seconds	6
4	23 Seconds	6

Figure 7.

Remarks:

1. Figure 7 lists the average speeds of the test load through the Hazard Course.
2. Inspection did not reveal any damage to the JMIP.

5. **WASHBOARD COURSE:**

Photo 3. Washboard Course Testing of the JMIP

Remarks: Inspection following the Washboard Course revealed no damage to the JMIP.

C. RAIL TEST.

Note: When loading the JMIP into the intermodal container, the point load caused by the JMIP side rail deformed the wall of the container.

Photo 4. Rail Impact Testing of the JMIP (Prior to Testing)

Description	Weight
Flatcar Number: DODX 42353	85,000 lbs.
JMIP in the Intermodal Container	30,880 lbs.
M1 Flatrack with MLRS Pods	28,265 lbs.
Total Specimen Wt.	144,145 lbs.
Buffer Car (four cars)	257,900 lbs.

Figure 8.

Remarks: Figure 8 lists the test components and weights of the items used during the Rail Impact Tests.

Impact Number	Avg. Velocity (mph)
1	4.4
2	6.9
3	8.8
4	8.8

Figure 9.

Remarks:

1. Figure 9 lists the average speeds of the specimen car immediately prior to impact with the anvil. Impact #4 is the reverse impact.
2. Inspection did not reveal any damage to the JMIP.
3. The JMIP was secured in the intermodal container.

D. ON/OFF ROAD TESTS.

1. HAZARD COURSE.

Photo 5. Hazard Course Testing of the JMIP

Pass No.	Elapsed Time	Avg. Velocity (mph)
1	23 Seconds	6
2	23 Seconds	6

Figure 10.

Remarks:

1. Figure 10 lists the average speeds of the test load through the Hazard Course.
2. The JMIP was secured in the intermodal container.
3. Inspection did not reveal any damage to the JMIP.

2. ROAD TRIP:

Remarks:

1. The Road Trip was conducted between the Hazard Course Passes #2 and #3.
2. Inspection following the Road Trip revealed no damage or movement of the JMIP.

3. PANIC STOPS: Testing was not required since the load was rail impact tested.

4. HAZARD COURSE:

Pass No.	Elapsed Time	Avg. Velocity (mph)
3	23 Seconds	6
4	23 Seconds	6

Figure 11.

Remarks:

1. Figure 11 lists the average speeds of the test load through the Hazard Course.
2. Inspection did not reveal any damage to the JMIP.

5. WASHBOARD COURSE:

Photo 6. Washboard Course Testing of the JMIP

Remarks: Inspection following the Washboard Course revealed no damage to the JMIP.

E. SHIPBOARD TRANSPORTATION SIMULATION (STS).

Remarks:

1. The JMIP slid side-to-side throughout the STS testing. The movement of the adjustment bolt on the cams occurred during the testing. Future designs of the cam locking devices should prevent the bolts from moving in and out.
2. The main rails scuffed and dug into the container floor during the STS testing.
3. The tie-down rings used to secure the 120MM Tank Ammunition Pallets contacted the container wall during the STS testing.

F. OBSERVATIONS:

1. One bolt on the rear bumper was loose and one fell out during testing.

2. The locks on some of the JMICs were difficult to unlock upon completion of the testing. The use of a pry bar was sometimes required to disengage the locks.

G. CONCLUSIONS:

1. The purpose of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval. Testing has identified deficiencies with the current design.

2. The JMIP, as currently designed, is adequate to be used to transport the mixed load of palletized ammunition and the JMICs when using the intermediate gates and cross straps on the end of the payload during the demonstrations.

3. The operational condition of the JMIP should be closely monitored during the demonstrations. Also, the Defense Ammunition Center, Transportation Engineering Division, shall be consulted for the ammunition loading and bracing instructions.

PART 6 – DRAWINGS

The following drawing represents the load configuration that was subjected to the test criteria.

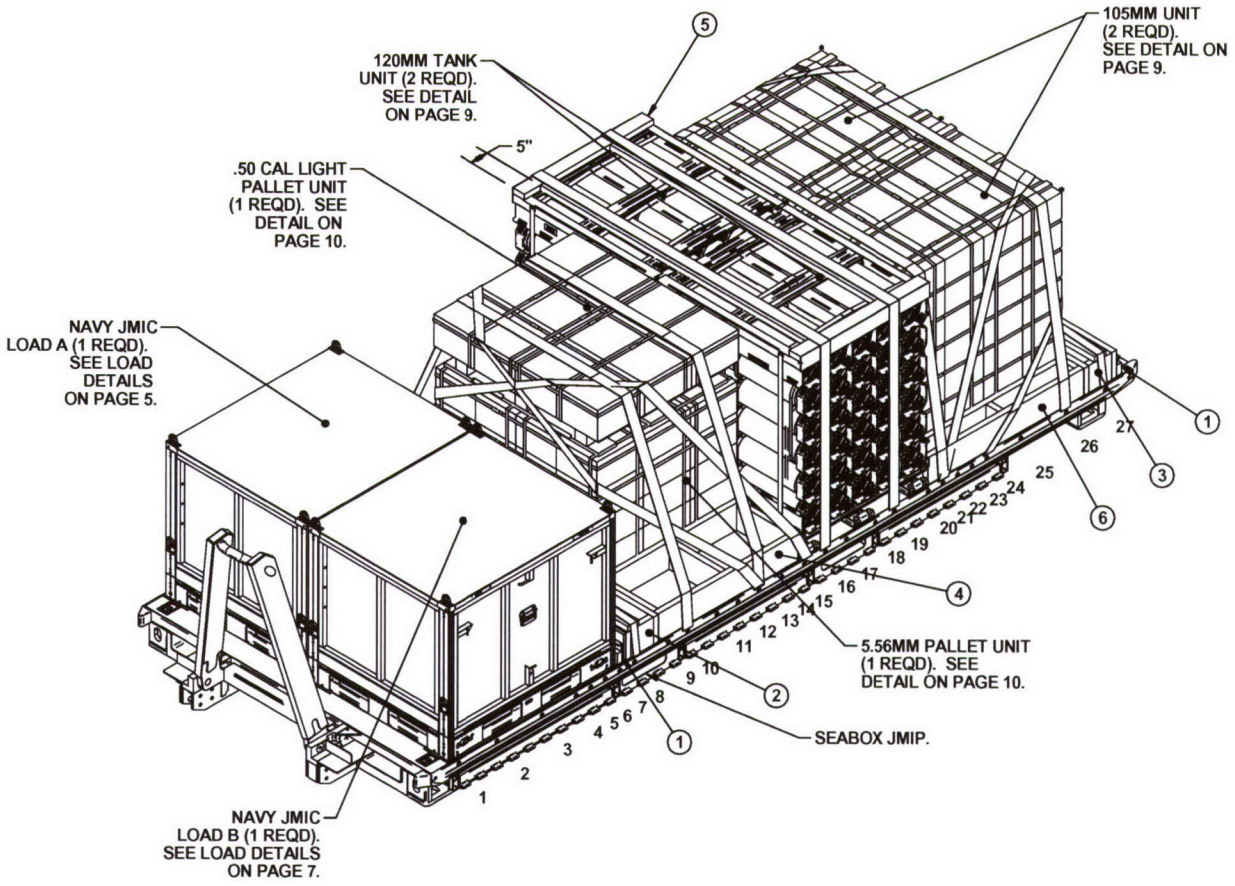
TEST SKETCH

LOADING AND BRACING OF MIXED LOADS ON THE JOINT MODULAR INTERMODAL PLATFORM (JMIP)

THIS TEN PAGE DOCUMENT DEPICTS NAVY JMICS AND CONVENTIONAL PALLETIZED AMMUNITION ON A SEABOX JMIP FOR TRANSPORTABILITY TESTING

PREPARED DURING MAY 2007 BY:
U.S. ARMY DEFENSE AMMUNITION CENTER
ATTN: SJMAC-DET
POC: MICHAEL BARTOSIAK
DSN 956-8083
COMM (918) 420-8083
FAX (918) 420-8811
E-MAIL: MICHAEL.BARTOSIAK@US.ARMY.MIL

LAURA A. FIEFFER
CHIEF, TRANSPORTATION ENGINEERING DIVISION



ISOMETRIC VIEW

(KEY NUMBERS CONTINUED)

⑩ FOWARD END RESTRAINT STRAP, 3-INCH WIDE WEB STRAP (2 REQD). INSTALL EACH STRAP TO EXTEND FROM THE TWELFTH TIEDOWN PROVISION ON ONE SIDE OF THE JMIP, AROUND THE SIDE OF THE 5.56MM PALLET UNITS, OVER THE TOP OF THE LIGHT .50 CAL PALLET UNIT, TO THE FIFTHTEENTH TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION.

⑪ AFT END RETAINER STRAP, 3-INCH WIDE WEB STRAP ASSEMBLY (2 REQD). INSTALL EACH STRAP TO EXTEND FROM THE TWENTY-FOURTH TIEDOWN PROVISION ON ONE SIDE OF THE JMIP, AROUND THE SIDE OF THE 105MM UNIT T UNIT, OVER THE TOP OF THE 105MM UNIT, TO THE TWENTY-FIRST TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION.

⑫ STRAPPING BOARD STRUT, 2" X 4" X 6'-10" (4 REQD). INSTALL ACROSS TOP OF C791 PALLET UNITS, LOCATED 5" AND 10" FROM THE END OF THE STRAPPING BOARD ASSEMBLIES. TOENAIL EACH END OF STRUT TO STRAPPING BOARD ASSEMBLIES WITH 2-10d NAILS.

KEY NUMBERS

① INTERMEDIATE GATE (4 REQD). ALIGN HOLES IN ENDS OF THE GATES WITH JMIC TIEDOWN PROVISIONS ON THE JMIP AT THE LOCATIONS SHOWN. SEE DETAIL ON PAGE 3.

② FORWARD BLOCKING ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 3. CENTER AGAINST FORWARD INTERMEDIATE GATES.

③ AFT BLOCKING ASSEBMLY (1 REQD). SEE DETAIL ON PAGE 3. CENTER AGAINST AFT INTERMEDIATE GATES.

④ SIDE BLOCKING ASSEMBLY FOR 5.56MM UNIT (2 REQD). SEE DETAIL ON PAGE 4.

⑤ SIDE STRAPPING BOARD ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 4.

⑥ SIDE BLOCKING ASSEMBLY FOR 105MM UNIT (2 REQD). SEE DETAIL ON PAGE 4.

⑦ HOLD-DOWN STRAP, 3-INCH WIDE WEB STRAP (6 REQD). INSTALL EACH STRAP TO EXTEND FROM THE DESIGNATED TIEDOWN PROVISION ON ONE SIDE OF JMIP, OVER THE TOP OF THE PALLET UNITS, TO THE CORRESPONDING TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP.

⑧ FORWARD RETAINER STRAP, 2-INCH WIDE WEB STRAP ASSEMBLY (1 REQD). INSTALL TO EXTEND FROM THE SECOND TIEDOWN PROVISION ON ONE SIDE OF THE JMIP, OVER THE TOP OF THE FORWARD BLOCKING ASSEMBLY STRAPPING BOARD, TO THE SECOND TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP.

⑨ AFT RETAINER STRAP, 2-INCH WIDE WEB STRAP ASSEMBLY (1 REQD). INSTALL TO EXTEND FROM THE EIGHTEENTH TIEDOWN PROVISION ON ONE SIDE OF THE JMIP, OVER THE TOP OF THE AFT BLOCKING ASSEMBLY STRAPPING BOARD, TO THE EIGHTEENTH TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP.

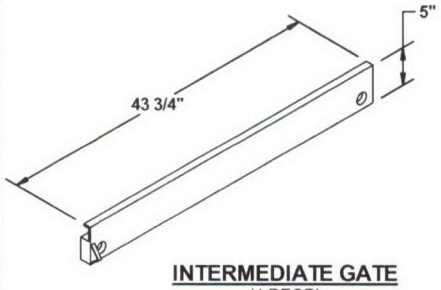
(CONTINUED AT LEFT)

BILL OF MATERIAL

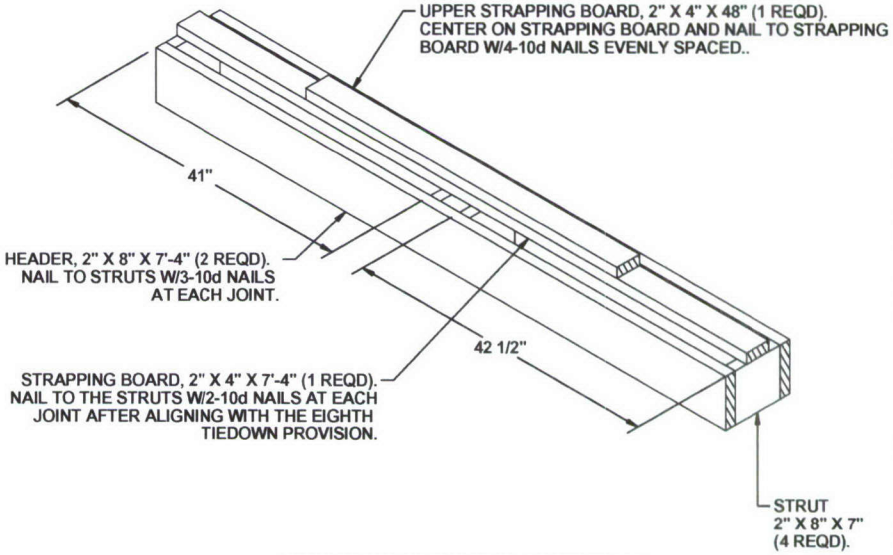
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	44	30
2" X 8"	75	100
NAILS	**NO. REQD**	**POUNDS**
6d (2")	12	.07
10d (3")	152	2.30
2" WEB STRAP TIEDOWN ASSEMBLY - 2 REQD - - - - -		12 LBS
1/8" PLYWOOD - - - - - - - 3.33 SQ FT - - - - -		2 LBS
INTERMEDIATE GATES - - - - - - 4 REQD - - - - -		33 LBS

LOAD AS SHOWN ON PAGE 2

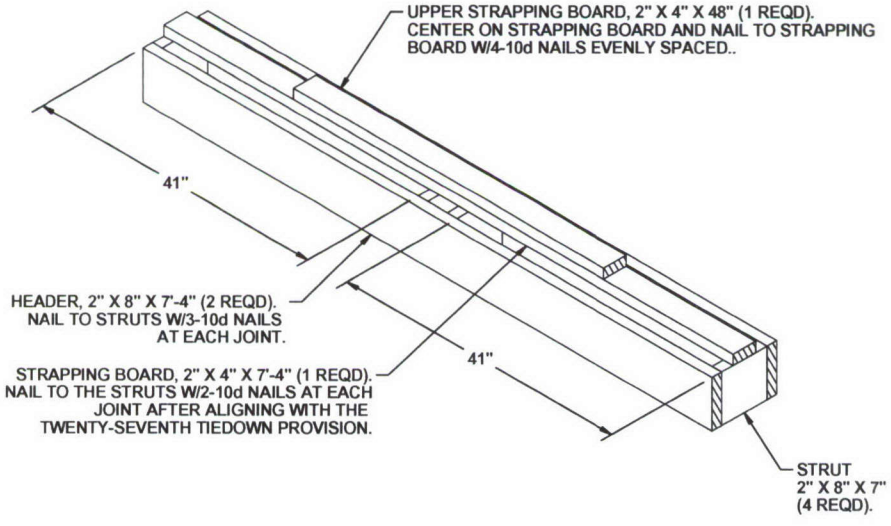
ITEM	QUANTITY	WEIGHT (APPROX)
NAVY JMIC LOAD A	1	2,971 LBS
NAVY JMIC LOAD B	1	2,651 LBS
105MM UNIT LOAD	2	5,908 LBS
120MM TANK LOAD	2	4,962 LBS
5.56MM UNIT LOAD	1	3,838 LBS
.50 CAL LIGHT PLT	1	986 LBS
DUNNAGE		309 LBS
JMIP		4,240 LBS
TOTAL WEIGHT - - - - - -		25,874 LBS (APPROX)



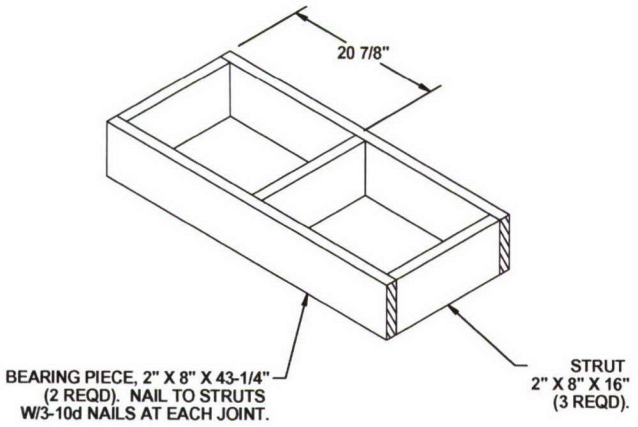
INTERMEDIATE GATE
(4 REQD)



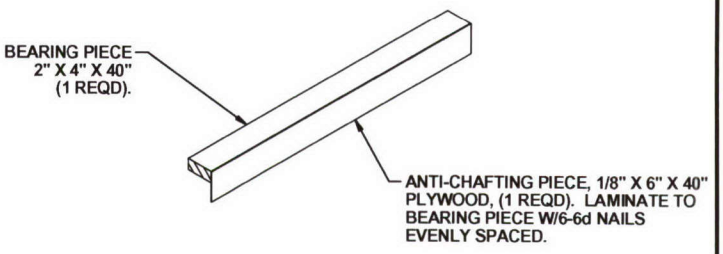
FORWARD BLOCKING ASSEMBLY
(1 REQD)



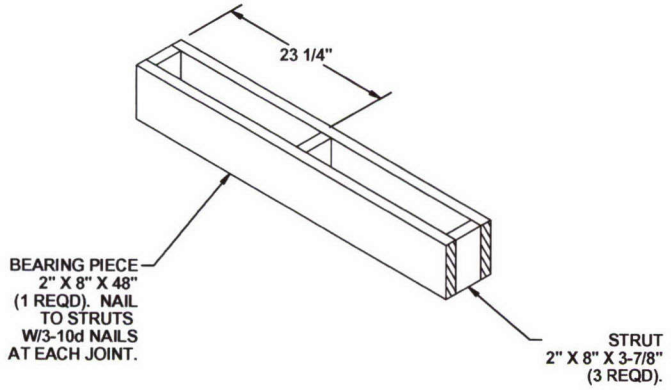
AFT BLOCKING ASSEMBLY
(1 REQD)



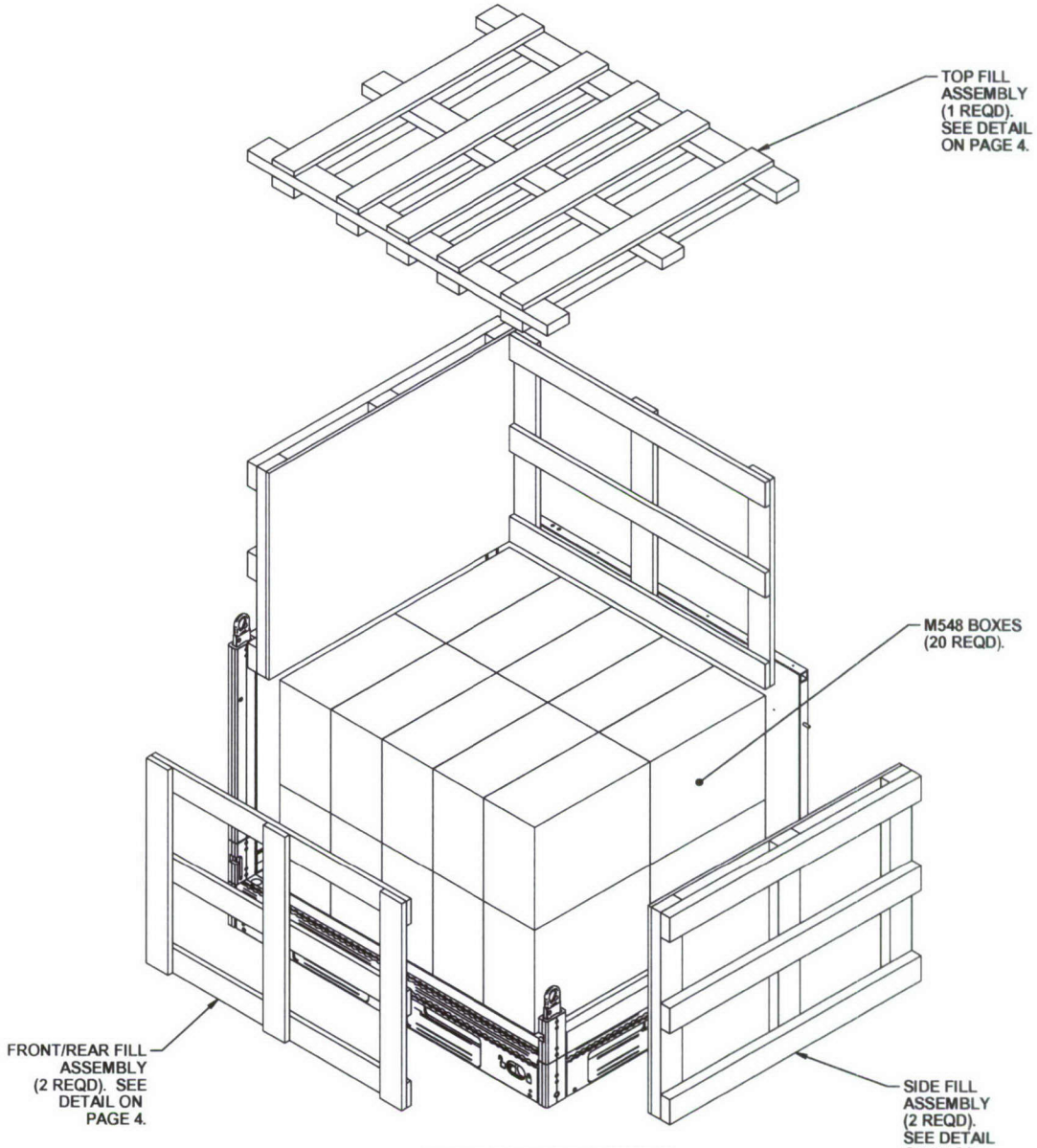
SIDE BLOCKING FOR A071 PALLET UNITS
(2 REQD)



SIDE STRAPPING BOARD ASSEMBLY
(2 REQD)



SIDE BLOCKING FOR C445 PALLET UNITS
(2 REQD)

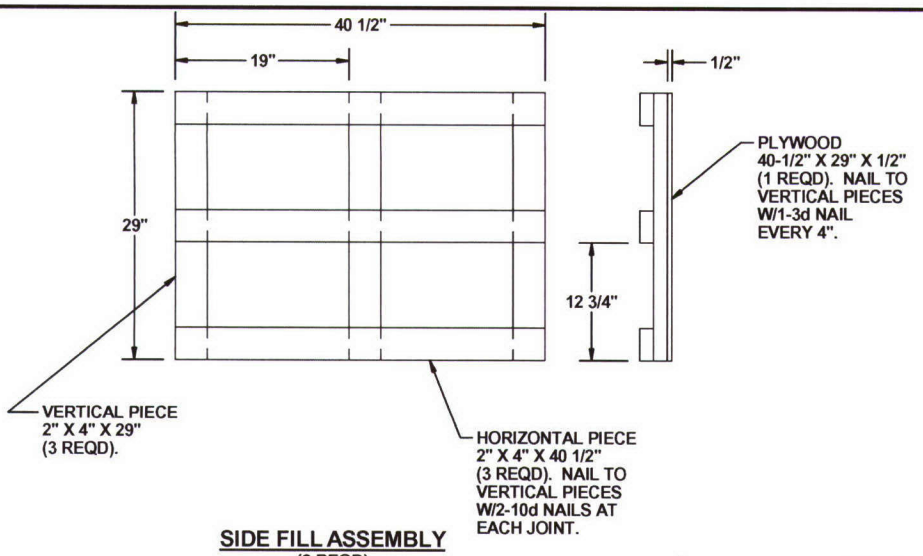


NAVY JMIC UNIT LOAD A
(2 REQD)

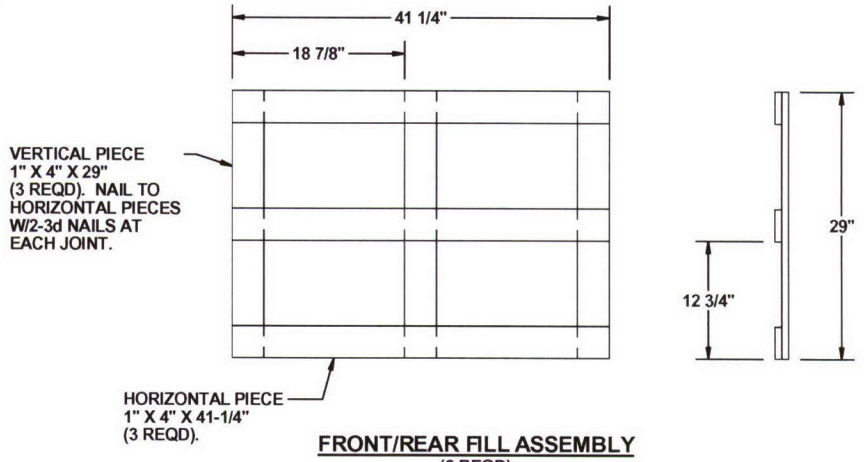
20 M548 BOXES @ 109 LBS	2,180 LBS
DUNNAGE	146 LBS
CLOSED PANEL NAVY JMIC	325 LBS
TOTAL WEIGHT	2,651 LBS (APPROX)
CUBE	56.4 CU FT (APPROX)

BILL OF MATERIAL

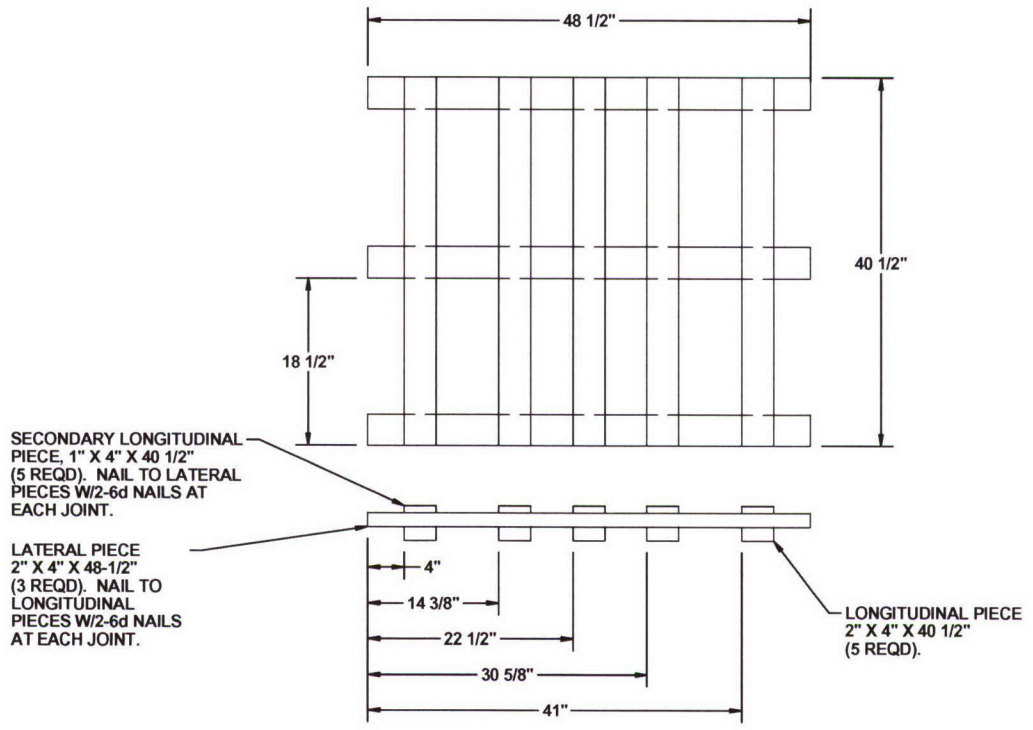
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	52	18
2" X 4"	64	43
NAILS	**NO. REQD**	**POUNDS**
3d (1-1/4")	84	.16
6d (2")	60	.35
10d (3")	36	.54
NAVY PANEL JMIC	1 REQD	325 LBS
1/2 PLYWOOD	17 SQ FT	23 LBS



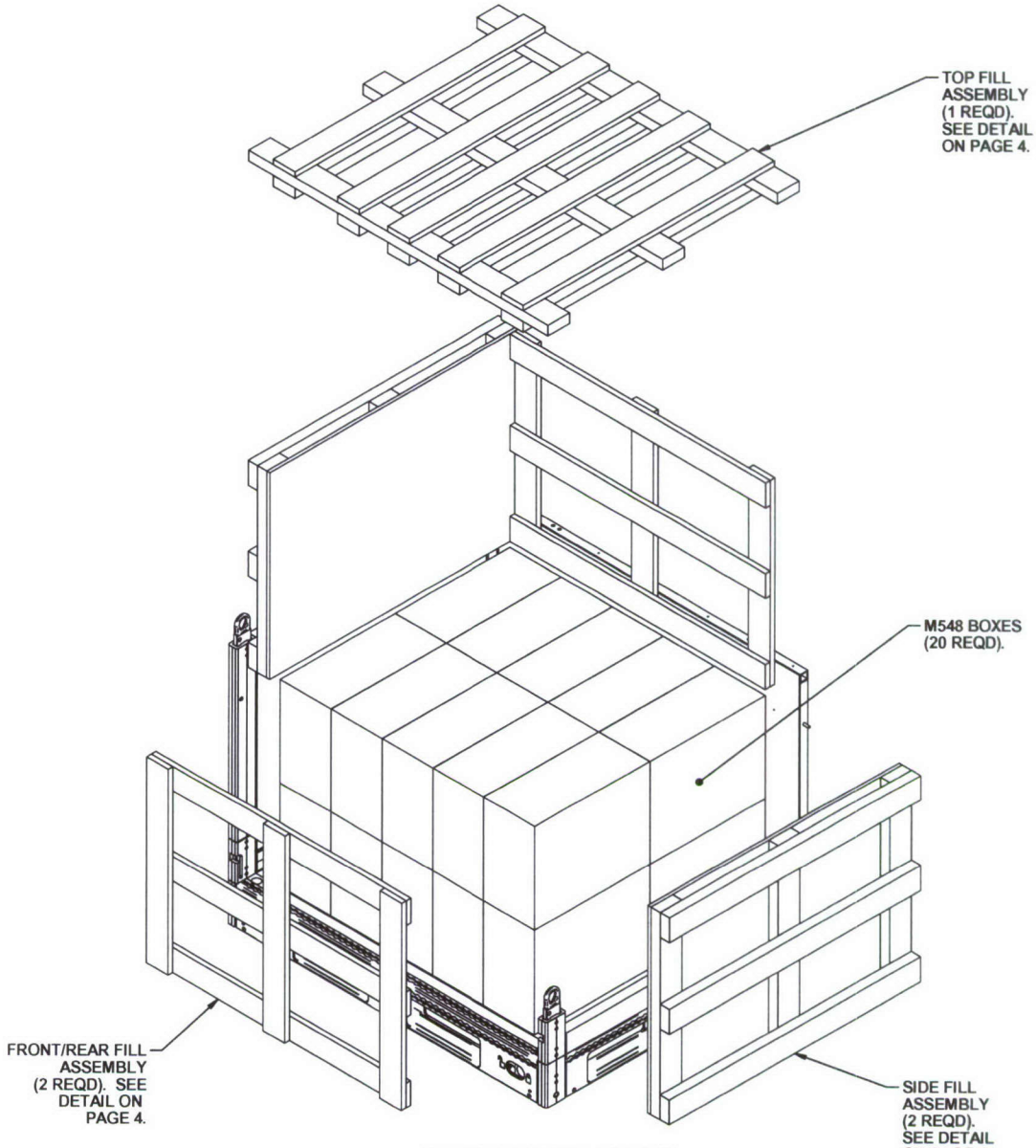
SIDE FILL ASSEMBLY
(2 REQD)



FRONT/REAR FILL ASSEMBLY
(2 REQD)



TOP FILL ASSEMBLY
(1 REQD)

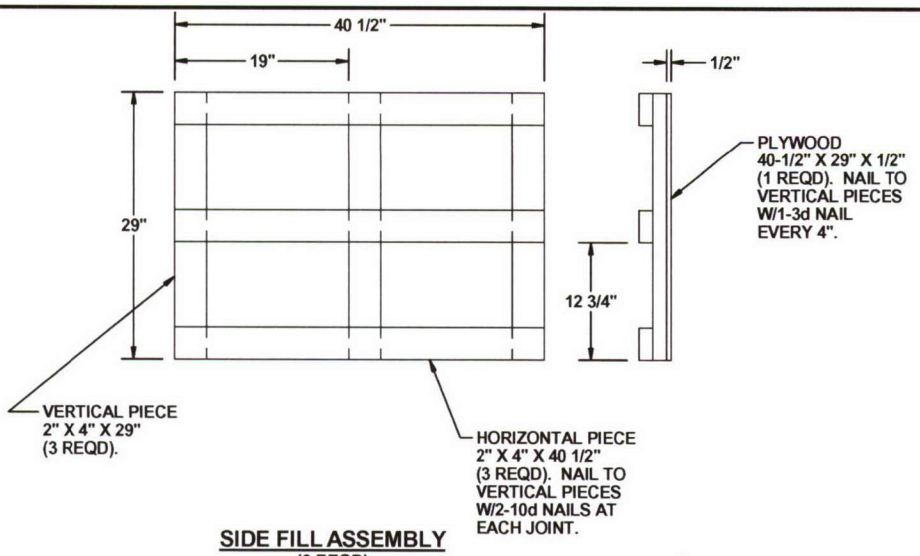


NAVY JMIC UNIT LOAD B
(2 REQD)

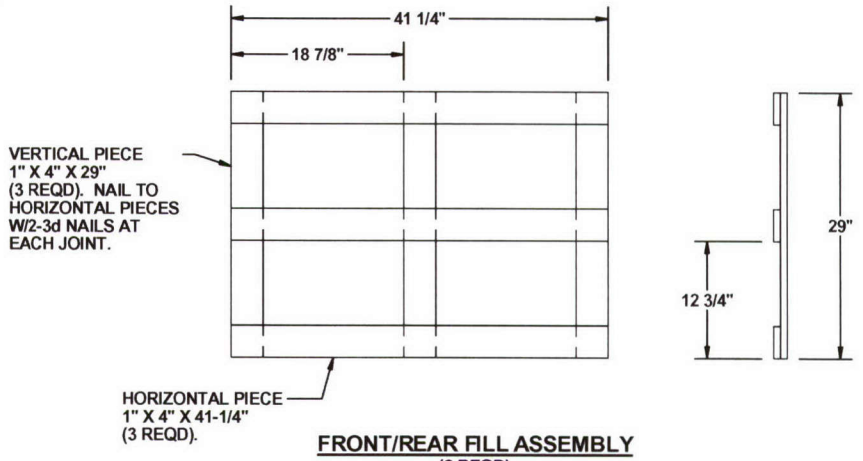
20 M548 BOXES @ 120 LBS	2,500 LBS
DUNNAGE	146 LBS
CLOSED PANEL NAVY JMIC	325 LBS
TOTAL WEIGHT	2,971 LBS (APPROX)
CUBE	56.4 CU FT (APPROX)

BILL OF MATERIAL

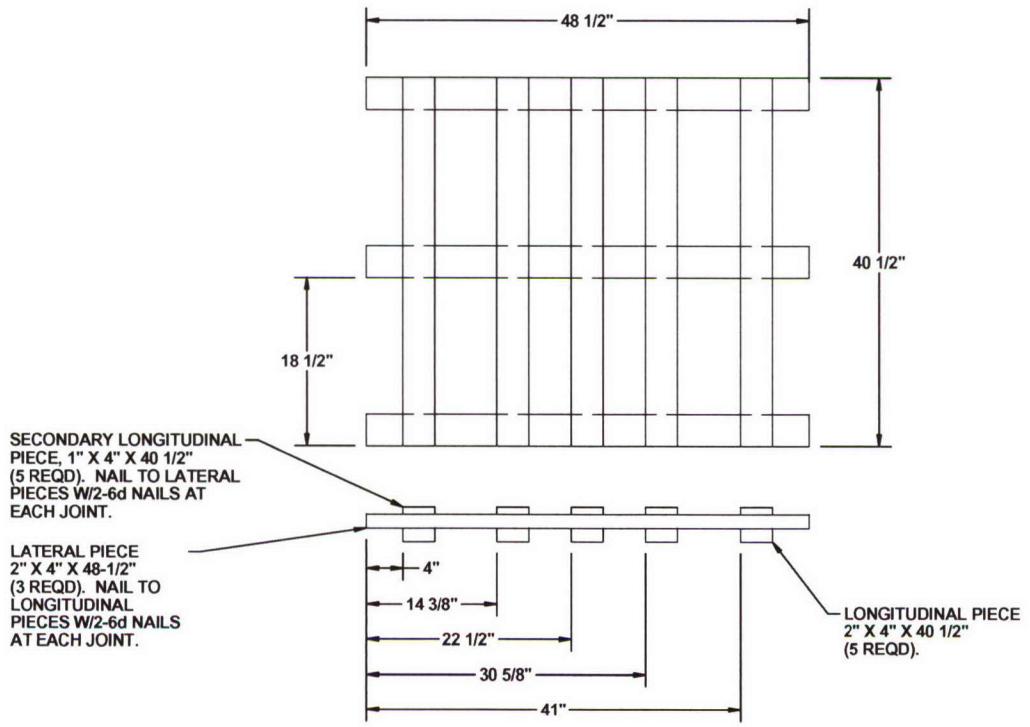
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	52	18
2" X 4"	64	43
NAILS	**NO. REQD**	**POUNDS**
3d (1-1/4")	84	.16
6d (2")	60	.35
10d (3")	36	.54
NAVY PANEL JMIC	1 REQD	325 LBS
1/2 PLYWOOD	17 SQ FT	23 LBS



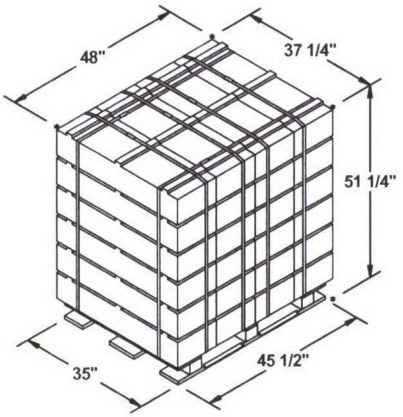
SIDE FILL ASSEMBLY
(2 REQD)



FRONT/REAR FILL ASSEMBLY
(2 REQD)



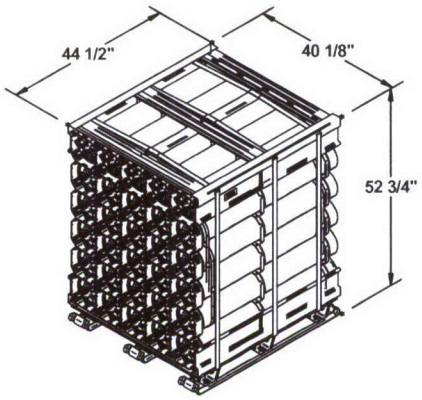
TOP FILL ASSEMBLY
(1 REQD)



BILL OF MATERIAL			
PALLET, 35" X 45-1/2"	1 REQD	65 LBS
STEEL STRAPPING, 3/4"	93.00' REQD	8.30 LBS
SEAL, FOR 3/4" STRAPPING	6 REQD	NIL

105MM PALLET UNIT

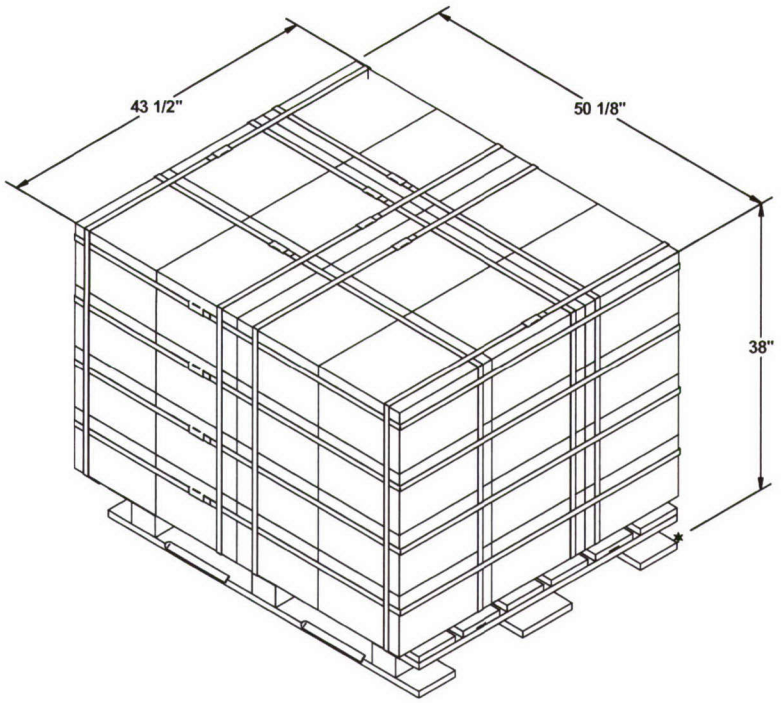
24 BOXES OF 105MM CARTRIDGE (2 PER BOX) @120 LBS	2,880 LBS
DUNNAGE	9 LBS
PALLET	65 LBS
TOTAL WEIGHT	2,954 LBS (APPROX)
CUBE	52.6 CU FT (APPROX)



BILL OF MATERIAL		
METAL PALLET, 44" X 40"	1 REQD	105 LBS
PALLET ADAPTER	1 REQD	41 LBS
TOP LIFT ASSEMBLY	1 REQD	54 LBS
STEEL STRAPPING, 3/4"	44.33' REQD	3.96 LBS
STEEL STRAPPING, 1-1/4"	46.50' REQD	6.64 LBS
SEAL, FOR 3/4" STRAPPING	4 REQD	NIL
SEAL, FOR 1-1/4" STRAPPING	3 REQD	NIL

120MM PALLET UNIT

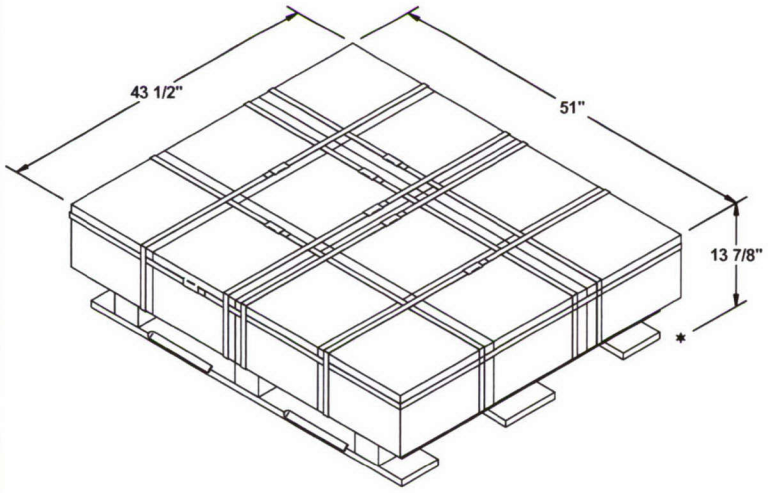
30 CONTAINERS OF 120MM CTG (1 PER CNTR) @ 76 LBS	2,270 LBS
DUNNAGE	106 LBS
PALLET	105 LBS
TOTAL WEIGHT	2,481 LBS (APPROX)
CUBE	54.8 CU FT (APPROX)



5.56MM PALLET UNIT

48 BOXES OF 5.56MM CTG (1,680 PER BOX) @ 78 LBS	3,744 LBS
DUNNAGE	14 LBS
PALLET	80 LBS
TOTAL WEIGHT	3,838 LBS (APPROX)
CUBE	47.8 CU FT (APPROX)

BILL OF MATERIAL		
PALLET, 40" X 48"	1 REQD	80 LBS
STEEL STRAPPING, 3/4"	148.83' REQD	13.29 LBS
SEAL, FOR 3/4" STRAPPING	10 REQD	NIL



.50 CAL LIGHT PALLET

12 BOXES OF .50 CAL CTG (200 PER BOX) @ 75 LBS	900 LBS
DUNNAGE	6 LBS
PALLET	80 LBS
TOTAL WEIGHT	986 LBS (APPROX)
CUBE	17.8 CU FT (APPROX)

BILL OF MATERIAL		
PALLET, 35" X 45-1/2"	1 REQD	65 LBS
STEEL STRAPPING, 3/4"	93.00' REQD	8.30 LBS
SEAL, FOR 3/4" STRAPPING	6 REQD	NIL